

Claims

1. A method of providing desulfurized hydrocarbon feed, comprising:

producing hydrogen-rich reformate from hydrocarbon feed in a small hydrogen generator; and

5 feeding said hydrogen-rich reformate along with the hydrocarbon feed to a hydrogen desulfurizer.

2. A method according to claim 1 wherein said producing step comprises:

producing hydrogen-rich reformate from the hydrocarbon feed and humidified air.

3. Apparatus for providing desulfurized hydrocarbon feed, comprising:

means including a small hydrogen generator for producing hydrogen-rich reformate from hydrocarbon feed;

5 a hydrogen desulfurizer; and

means for feeding said hydrogen-rich reformate along with the hydrocarbon feed to said hydrogen desulfurizer.

4. A system for desulfurizing hydrocarbon feeds, comprising:

a source of hydrocarbon feed;

5 a small hydrogen generator receiving said hydrocarbon feed from said source and providing hydrogen-containing reformate gas; and

a hydrogen desulfurizer receiving said hydrocarbon feed from said source of hydrocarbon feed and receiving said hydrogen-containing gas from said small hydrogen generator.

5. A system according to claim 4 further comprising:
a source of humidified air; and wherein
said small hydrogen generator receives humidified air from the corresponding source to produce said reformate gas from said fuel and said air.
6. A system according to claim 4 wherein:
said small hydrogen generator is a mini-CPO (catalytic partial oxidizer).
7. A system according to claim 4 wherein:
said small hydrogen generator is a mini-POX (non-catalytic partial oxidizer).
8. A system according to claim 4 wherein:
said small hydrogen generator is a mini-ATR (auto-thermal reformer).
9. A system for producing hydrogen-rich reformate from hydrocarbon feeds, comprising:
a source of hydrocarbon feed;
a source of water;
5 a small hydrogen generator receiving hydrocarbon feed from said source to produce hydrogen-containing reformate gas;

10 a hydrogen desulfurizer receiving hydrocarbon feed from said source of hydrocarbon feed and hydrogen-containing reformate gas from said small hydrogen generator, and providing desulfurized hydrocarbon feed; and

15 a fuel processor including a major reformer receiving said desulfurized hydrocarbon feed and said humidified air and producing hydrogen-containing reformate, a water-gas shift reactor receiving said hydrogen-containing reformate and water and feeding the resultant gas into a preferential CO oxidizer, for producing hydrogen-containing reformate for use as fuel, whereby recycled hydrogen gas from the output of said fuel processor is not required for said desulfurizer, thereby (a) eliminating the need for an expensive, power consuming hydrogen blower and (b) reducing the steam fed into said 20 hydrogen desulfurizer.

10. A system according to claim 9 further comprising:
a source of humidified air; and wherein
said small hydrogen generator receives humidified air from the corresponding source to produce said reformate gas from said fuel
5 and said air.

11. A system according to claim 10 wherein:
said small hydrogen generator is a mini-CPO (catalytic partial oxidizer).

12. A system according to claim 10 wherein:
said small hydrogen generator is a mini-POX (non-catalytic partial oxidizer).

13. A system according to claim 9 wherein:
said small hydrogen generator is a mini-ATR (auto-thermal
reformer).